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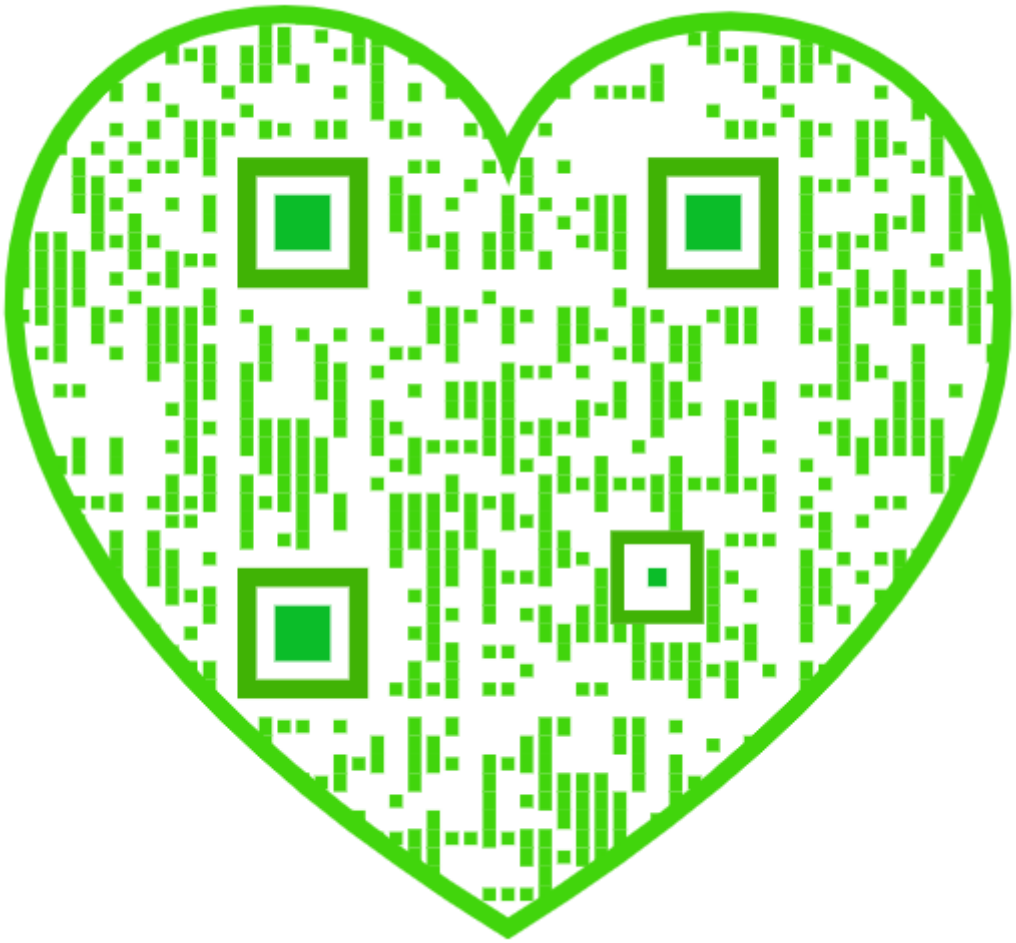

CORRESPONDENCE

RELATING TO THE INVENTION

OF THE

JACQUARD BRUSSELS CARPET

POWER LOOM.

BOSTON:
ALFRED MUDGE & SON, PRINTERS,
34 School Street.
1868.

CORRESPONDENCE.

MONKHILL, near PONTEFRACT, YORKSHIRE,
17th September, 1868.

Dear Sir: — A question having recently arisen as to the origin of weaving Jacquard Brussels Carpeting by Power Looms, and as many of those who were intimately acquainted with the circumstances are fast passing away, I think it best to gather up the evidences of the case; and although you were not in England or acquainted with me at the time I began this work, yet your subsequent knowledge of the subject will, I believe, enable you to confirm the evidence of the numerous English Carpet Manufacturers, who know the history of this matter, and you will, I believe, have much pleasure in doing so.

I need not here allude to the circumstances which led me in 1839 to enter on that work, nor to my proceedings during many years therein, but will ask the favor of your allowing me to occupy a portion of your valuable time with some mechanical details and facts.

You will doubtless be aware of the great obstacle which presented itself to me when I first attempted the application of steam power movements to the Jacquard Brussels Carpet Loom, viz: the "clearing the leash," or the making a clear shed for

the introduction of the terry wire. Every carpet manufacturer of that day to whom I mentioned the subject, declared power weaving of Brussels carpets to be impossible, because of the special difficulties attendant upon making a clear shed for the wire, that being then done by the tedious operations of the "drawboy" and his "sword," these were considered essential accomplishments, and impossible to be done by machinery.

There having been no previous experiments, I had to feel my way in the dark, and was so fortunate as to see the causes of the difficulty, and to devise means for removing them. These, as you will be well aware, consisted in

1st. Removing the tension weight which was placed on each of the worsted warp bobbins, from the bobbins and placing it on to the thread itself. Patented 1840.

2d. Abolishing the "poll shaft," or heddle for working the entire body of worsted warp up and down, for the shuttle, and substituting for it the lifting of the mounture and bringing the latter forward to immediately behind the traverse of the batten, thereby removing a great cause of the entanglement of the pattern threads, and by so materially shortening the base line, obtaining a very acute angle of inclination in the pattern threads when drawn up, and completely mastering the fibrous adhesion of the worsted threads.

3d. In removing the heddles for working the linen ground warp from the front of, and the placing them behind the mounture.

I think you will agree with me that these were the inventions which made the weaving Jacquard Brussels carpets by power loom practicable, and, as I believe, is and must forever be the fact, that they are embodied in, and are essential to every Brussels power loom in the world.

The wire motion and other arrangements though necessary to complete the loom, are of course comparatively minor matters and none of those used are in themselves essential to power weaving, there being a great variety of them.

I applied for an American Patent about 1841, and went to considerable expense for models of portions of the Patent, but was refused a Patent on the ground that part of the Patent, viz, the wire motion was somewhat similar to a motion previously patented there for drawing in bristles in making foundations for stocks or neckerchiefs. Ideas at that time as to inserting terry wires, were involved in a belief (since shown to be erroneous) that it was necessary to draw or carry in the wire. My models, drawings and description were of course detained, in the United States Patent Office or Museum.

As America has had the advantage of my Inventions, which twenty-seven or twenty-eight years have shown to be unique and essential as to the principal points of weaving Brussels carpets by power loom, without my having ever received one cent of benefit from that part of the world, I should be glad, if the foregoing recital is in accordance with your belief, if you would be kind enough to send me your testimony as to the value and originality of my inventions, which will be highly valued by me.

I remain, dear Sir, yours faithfully,

WM. WOOD.

Erastus B. Bigelow, Esq., Boston.

Boston, December 5, 1868.

William Wood, Esq., Monkhill, near Pontefract, England:

Dear Sir, — Your favor of the 6th November, and the printed letters enclosed, are received; and, I now take the earliest opportunity since my acknowledgement of yours of the 17th of September, to answer your inquiries in regard to the dates of the inventions in this country, applicable to the weaving of terry fabrics, especially Jacquard Brussels carpets.

The first power loom for weaving terry fabrics known in the history of the arts, I invented in 1836, and obtained letters patent of the United States for it under the title of "Improve-

ments in the power loom for weaving coach lace and other similar fabrics," the twentieth day of April, 1837.

This loom was in all respects self-acting, and embraced the main features of the Brussels carpet loom. It successively withdrew, transferred and inserted the terry wires; severally governed the delivery of the worsted warps from the bobbins, and regulated their tension by a tension weight on each thread; delivered out the ground warps and took up the finished cloth, in such manner as to make the figures woven thereon of uniform length; shedded the ground warps for the introduction of the shuttle, and raised the worsted warps for the insertion of the terry wires, in the order required to form the figure; operated the shuttle, and beat up the cloth.

For weaving coach lace it came quickly and extensively into practical use.

I made my first application of this invention to the weaving of Jacquard Brussels carpets at Lowell in 1845, and for this loom, which worked regularly and successfully, I obtained a patent in England the eleventh day of March, 1846, and in the United States at a subsequent date.

This I believe to be the first *automatic* power loom for weaving Jacquard Brussels carpets then known. There were other English inventions of later date than my original invention for weaving terry fabrics, which were designed to accomplish the same object, but they did not constitute an *automatic* loom, as the terry wires had to be drawn from the cloth and placed preparatory to their reinsertion in a feeding hopper or trough, *by hand*.

The distinguishing feature of a power loom for weaving terry fabrics, of which Jacquard Brussels carpets is one variety, consists in automatic mechanism for operating the terry wires. Therefore, your claim to be the first inventor of this class of looms on the ground of having made certain improvements in

the mode of shedding the warps, rests on a very slender foundation. Could you show that you were first inventor of your alleged improvements in the mode of shedding the warps, it would not justify your claim to be the first inventor of the Jacquard Brussels carpet power loom; as the first inventor is the one who first completely organized the loom so as to operate automatically and successfully; and, as it can be shown that you are not the first inventor of even these shedding improvements, your entire claim falls at once to the ground.

Let us now look at the evidence in support of this view of the case.

Although you make no claim to be the first inventor of the "wire motion," your statement that it is a "comparatively minor matter" requires some notice. The wire motion is not only, as before stated, the distinguishing feature of the power loom for weaving terry fabrics, but it was the most difficult part to supply. Before I invented it in 1836, there was no published record of any previous attempt to produce it having been made. And though, as you state, no one of the various forms which the wire motion has since assumed is essential to power loom weaving, still a wire motion is essential; and the first inventor of it is entitled to proper recognition in the history of the origin of this class of looms, especially as all the wire motions now in use embody the substantial features of the original one. But in your communication you claim to have rendered the weaving of Jacquard Brussels carpets by power looms practicable by overcoming three difficulties; and, to avoid misapprehension, I will reproduce your remarks on each of the three points in the order in which you state them, and in which I shall take them up.

The first difficulty you say you overcame by "removing the tension weight which was placed on each of the worsted warp bobbins from the bobbins and placing it on the thread itself — patented 1840."

This method of giving tension to the worsted threads I invented in 1836, and in that year put it in practical use in weaving coach lace, and in the same form in which it is now used on all our looms for weaving Jacquard Brussels carpets.

The second difficulty you claim to have overcome by "abolishing the poll shaft or heddle for working the entire body of the worsted warp up and down for the shuttle, and substituting for it the lifting of the mounture and bringing the latter forward to immediately behind the traverse of the batten, thereby removing a great cause of the entanglement of the pattern threads, and by so materially shortening the base line, obtaining a very acute angle of inclination in the pattern threads when drawn up, and completely mastering the fibrous adhesion of the worsted threads."

To rightly understand the grounds of your claim to be the first inventor of this improvement, it is necessary to consider the state of the art of weaving at the date of your alleged invention. In operating Jacquard *hand* looms it was an object to avoid raising the mounture, or weighted cords of the Jacquard as much as possible, on account of the physical exertion required therefor. Therefore, in weaving certain fabrics, such, for example, as counterpanes, quiltings, and Jacquard Brussels carpets, the mounture was placed at a considerable distance back of the batten; and a poll shaft or leaf of heddles employed to raise the warps connected with the Jacquard harness for the passage of the shuttle, whilst the Jacquard harness remained at rest. But when power was applied to Jacquard looms, whereby physical exertion for raising the mounture or Jacquard harness was superseded, it was found to be more convenient, and the means of forming a better shed, to move the mounture forward near the backward traverse of the batten, and to raise the warps by it for the passage of the shuttle, thereby dispensing with the poll shaft or leaf of heddles previously used for that purpose. This improvement in Jacquard power looms I invented in 1838; successfully applied it to the weaving of counterpanes in 1839;

patented it in the United States 24th of April, 1840; and in England the 6th of January, 1841.

But it may be said that weaving counterpanes is a different thing from weaving Jacquard Brussels carpets. So it is, in many respects, but the raising of the mounture to form the shed for the passage of the shuttle is the same in both cases. The mode which we employ for this purpose in all our Jacquard Brussels carpet looms, and which is now generally used in England is identically the same as that which I applied to counterpane weaving in 1839.

The third and last difficulty which you encountered, you say you overcame by

"Removing the heddles for working the linen ground warps from the front of, and the placing them behind the mounture."

Whether or not, this obvious mode of arranging the linen ground warp heddles can be regarded as an invention, I need not here inquire; but it is certainly not essential to the weaving of Jacquard Brussels carpets by power looms, for such carpets can be successfully woven with the linen ground warp heddles placed forward of the mounture, as was usual before power was applied to this branch of weaving.

To ascertain the views of the officers of the United States Patent Office in regard to your alleged inventions, I have procured a copy of the claims of your rejected application to which you have referred, and of the *official* letter, dated 23d August 1842, giving the reasons for its rejection.

The section of your claims, relating to the raising of the mounture is as follows:

"The method of raising and lowering the worsted warps exhibited in figures 1 and 2 of sheet 3 of the drawings, instead of affecting it by means of the heddles or heddle Q. Q., the said method consisting in elevating and depressing the entire Jacquard apparatus and camber board as described."

The official letter in giving the grounds of rejection states, that

"This section interferes with a patent lately granted to Erastus B. Bigelow of Lowell, Mass., in which the camber board and the mounture are elevated without the whole of the Jacquard, thus effecting the same object by means substantially the same."

The section of your claim relating to the location of the heddles, for working the linen ground warps, is as follows:

"Arranging the linen heddles, R. R., in rear of the mounture, as exhibited in sheet 3, and in a frame which, by suitable mechanism, may be elevated and depressed, the same being for the purpose of causing the worsted warps to clear better, and of permitting the linen warps to fall away from their ordinary position, and thus facilitate the introduction of the looping wire into the shed, formed between the figure and linen warps, the whole being constructed and operated as described."

In regard to this claim the official letter states, that

"This section in the original does not present anything new, and the same section in the loose sheet of proposed claims is defective. There are no linen heddles R. R. in figures 1 and 2, of sheet 3, and the new addition of heddles to the Jacquard apparatus does not present anything new."

Specimens of Jacquard Brussels carpeting woven by my power loom, were exhibited at the "Great Exhibition of the Works of Industry of all Nations" in London in 1851; but not until after the prizes had been awarded. The jury in a "supplement" to their report* state that,

"The specimens of Brussels carpeting exhibited by Mr. Bigelow are woven by a power loom invented and patented by him, and are better and more perfectly woven than any hand loom goods that have come under the notice of the jury. This, however, is a very small part of their merit, or rather that of Mr. Bigelow, who has completely triumphed over the numerous obstacles that presented themselves, and succeeded in sub-

* See Reports by the Juries, Vol. II, page 1,040.

stituting steam power for manual labor in the manufacture of five-frame Brussels carpets. Several patents have been taken out by different inventors in this country for effecting the same object; but as yet none of them have been brought into successful or extensive operation, and the honor of this achievement, one of great practical difficulty, as well as of great commercial value, must be awarded to a native of the United States."

Your accusation that

"America has had the advantage of your inventions, which twenty-seven or twenty-eight years have shown to be unique and essential as to the principal points of weaving Brussels carpets by power loom, without your having ever received one cent of benefit from that part of the world,"

needs no other answer than the foregoing statement of facts.

I am, dear sir, very truly yours,

E. B. BIGELOW.

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